

REMARKS

Claims 1-38 were pending in the application, with claims 1, 13, 14, 28, and 35 being independent. Applicant amends claims 1, 13, 14, 28, and 35 to at least include the feature recited in claims 6 and 30, amends claims 15-18, 32, and 37 for clarity, cancels claims 6, 25-27, and 30, and add new claims 39-50. Applicant also amends the specification to correct minor typographical errors. Accordingly, no new matter is added.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 14, 15, 19-27, and 35-38 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

In response, Applicants submits that claims 14 and 35, as amended, along with the claims depending therefrom, recite sufficient structure to comply with 35 U.S.C. § 112, second paragraph. Applicant cancels claim 27, and respectfully requests that the Examiner withdraw this rejection with respect to the remaining claims.

Claim Rejections Under 35 U.S.C. § 102(e)

Claims 1, 3, 8, 14, 22, 28, 32, and 35 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,496,257 to Taniguchi et al. (Taniguchi). Applicants respectfully traverse this rejection for the following reasons in light of the above amendments.

According to the Office Action, Taniguchi "shows an apparatus for monitoring the functionality of an optical element (objective lens OB) comprising a detector (120) and [a] light source (118) whose radiation is reflected to the detector by a surface of the optical element facing the detector and the light source."

Taniguchi discloses a inspection control system including a projection optical system inspection device 125, including a light emission unit 118, a diverging mirror 119, first and second light-receiving members 120 and 121 and an inspection control system 122. The light emission unit 118 is provided in the vicinity of the exposed part of the casing 110 on the wafer

stage WST. The first light-receiving member 120 is disposed on the wafer stage, which receives the light from the light emission unit 118 reflected on the surface of the objective lens OB, and the second light receiving member 121 is disposed above the wafer stage, which receives the light from the light emission unit 118 diverged on the diverging mirror 119. See Taniguchi, col. 31, lines 13-19.

Applicant submits that the inspection control system of Taniguchi requires a separate offline process to determine the contamination level of the surface of the objective lens. Specifically, Taniguchi provides that “during inspection contamination, the wafer W is not placed at the exposure position [for photolithographic processes of the wafer].” See e.g., Taniguchi at col. 30, lines 40-46. But rather, “[t]he wafer stage WST is moved to a contamination-inspection position shown in FIG. 18 in accordance with the drive control system.” See e.g., Taniguchi at col. 31, lines 52-54.

Accordingly, Taniguchi does not disclose simultaneous inspection of an optical element during processing with a laser resonator. One way to accomplish this is presented in Applicant’s amended claim 35, which now recites “a method for monitoring damage to an optical element of a laser resonator comprising shining a light beam onto a surface of the optical element; detecting a light intensity of a reflected portion of the light beam that is reflected by the optical element while shining the light beam on the surface of the optical element; and comparing the light intensity of the reflected portion of the light beam with a reference intensity.” Accordingly, the optical element can be monitored during operation of the laser without the requirement of an offline process step, thereby improving overall processing time and improving the operation of the system.

Moreover, claim 1, as amended, recites an “apparatus for monitoring the functionality of an optical element comprising a detector; and a light source whose radiation is reflected to the detector by a surface of the optical element facing the detector and the light source, wherein the light source and the detector are integrated in a holder for the optical element.” In contrast, the light emission unit 118 and the first light-receiving member 120 of Taniguchi are positioned on a wafer stage, which is described as a work table. (See Taniguchi, col. 31, lines 3-43, and FIGS.

18 and 19). Nowhere does Taniguchi disclose an apparatus for monitoring the functionality of an optical element including a light source and a detector integrated in a holder for the optical element, as now recited in claim 1. Applicant amends independent claims 13, 14, 28, and 35 to include the limitation now added by amendment to claim 1, and submits that claims 13, 14, 28, and 35 are allowable for at least the same reasons. Claims 3 and 8 depend from claim 1 and claim 32 depends from claim 28 and are also allowable.

Claim Rejections Under 35 U.S.C. § 103

Claims 2, 4-7, 9-13, 15-21, 23-27, 29-31, 33-34, and 36-38 stand rejected under 35 U.S.C. § 103 as being unpatentable over Taniguchi. Applicants respectfully traverse this rejection for the following reasons in light of the above amendments.

The Office Action concedes that Taniguchi “does not [teach] integrating the light source and detector into a holder for the optical element [but that it] would have been obvious that such a monitoring apparatus could be attached to a holder of an optical element, and this would have the advantage of keeping the relationship between the optical element and the monitoring apparatus proper to better insure accurate measurements, and would save time because the monitoring could be done without having to move the optical element or monitoring apparatus to make the needed measurements.”

Applicant submits that it would not be obvious to a person of ordinary skill in the relevant art to modify the apparatus of Taniguchi to include a light source and a detector integrated in a holder for the optical element. Nor would it be obvious to reconfigure Taniguchi to allow simultaneous inspection of an optical element during processing with a laser resonator. As described above, the inspection control system of Taniguchi requires a separate offline process to determine the contamination level of the surface of the objective lens.

One of ordinary skill would be deterred from applying Taniguchi’s system in a laser head, due at least to the perceived difficulty associated with arranging and attaching the several components of Taniguchi’s apparatus without interfering with the path of the laser beam. “If the proposed modification would render the prior invention being modified unsatisfactory for its

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intended purpose, then there is no suggestion or motivation to make the proposed modification.”
In re Gordon, 733 F.2d 900 (Fed. Cir. 1984). *See also* M.P.E.P. § 2143.01.

Applicant has added new dependent claims reciting limitations that further distinguish Taniguchi. For example, claim 39 requires that the detector, the light source, and the optical element of the apparatus recited in claim 1 be exposed to a common vacuum pressure. Claim 40 provides that the light source wherein the light source of the apparatus in claim 1 be positioned so as to provide an unobstructed pathway to the surface of the optical element.

Taniguchi does not teach or suggest the subject matter of claims 2, 4-7, 9-13, 15-21, 23-24, 29-31, 33-34, 36-38, 39-50, depending from claims 1, 13, 14, 28, and 35, as amended. Accordingly, claims 2, 4-7, 9-13, 15-21, 23-24, 29-31, 33-34, 36-38, 39-50 are allowable over Taniguchi.

CONCLUSION

The undersigned attorney remains available for consultation should the Examiner question the allowability of the claims as presently worded.

Applicants submit that all claims are in condition for allowance and such allowance is respectfully solicited.

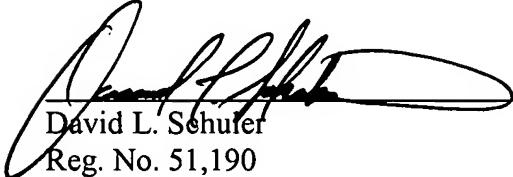
Enclosed is a check for \$350.00 for excess claim fees and a check for \$120.00 for the Petition for One Month Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, referencing attorney docket number 15540-011001.

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Respectfully submitted,

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